Eliot (J)

[Extracted from the American Journal of the Medical Sciences for April, 1877.]

SIMULTANEOUS LIGATION OF THE CAROTID AND SUBCLAVIAN ARTERIES FOR ANEURISM OF THE ARTERIA INNOMINATA.

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About seven or eight cases of simultaneous ligation of the subclavian and carotid arteries, for aneurism of the arteria innominata, have been reported up to the present time. The success which has followed the ligation of these vessels (simultaneously) has not been sufficiently favourable to encourage surgeons to repeat the operation, except under the most pressing necessity, as in the case now reported. Of the simultaneous operations reported, Rossi's case died in six days; Heath's recovered; Hutchinson's died on the forty-first day; Maunder's died on the sixth; Sand's living six months after the operation; Lane's some improvement, afterwards rapid increase of the aneurism; Holmes's died in four weeks, and the case, the subject of the present report, terminated fatally on the twenty-fifth day after the operation.

During the latter part of September, 1876, Stanley L., coloured, aged 41 years, married and of good physique, called upon me complaining of a beating tumour on the neck; it was at once diagnosed as aneurism. The tumour was nearly the size of a man's fist, and was situated a little to the right of the mesial line of the neck, the lower margin being nearly over the sterno-clavicular articulation, the upper over the thyroid cartilage. He stated that three years ago there appeared a lump about the size of a walnut, soft at first, then becoming harder. This enlargement remained stationary about three months, when it partially disappeared. About two years ago it again increased in size, with marked pulsation; it remained in that condition until about six months ago, when it rapidly increased in its proportions. The patient's condition at the time he sought advice was deplorable in the extreme, if not hopeless; the poor fellow was greatly alarmed at the rapid increase of the tumour, and he fully appreciated his dangerous condition and expessed his apprehension

that death might terminate his existence at any moment. He begged earnestly for relief, and expressed his willingness to undergo any mode of treatment that afforded the slightest hope of prolonging his life. The operation and the uncertainty of its relieving him were carefully explained to him; also to his immediate family and friends. After consultation with several distinguished surgeons of our city, it was determined after careful and repeated examination of the patient to operate on him, the distal (Brasdor's) operation being selected as offering the best chance of success. It was deemed advisable before proceeding, to submit the sufferer to a course of treatment, which, if it did not benefit him, would at least place him in a more favourable condition for surgical interference. As soon as arrangements could be made he was placed in the recumbent position and perfect quiet enjoined, both physical and mental; he was put on dry nutritious but unstimulating diet. Bromide of potassium was administered freely during this period, with the double object of controlling the arterial action and tranquillizing the mind. It was proposed to submit the patient to this treatment for at least five or six weeks before operating, but his condition becoming worse, the aneurismal tumour increasing with alarming rapidity, its pulsation growing more violent, and significant changes in its appearance manifesting themselves, giving unmistakable signs of speedy ulceration, and the patient appealing to his attendants for relief, it was determined to yield to his solicitations and operate at an early date. The patient was removed to Providence Hospital on the afternoon of the 12th of October. On Sunday morning, the 15th Oct., assisted by Profs. Robert Reyburn and F. A. Ashford, with Dr. P. J. Murphy administering the anæsthetic and Dr. Charles M. Ford in charge of the pulse, I proceeded to ligate the primitive carotid in its upper cervical region, and immediately afterwards tied the subclavian in its third surgical division. Among the gentlemen who were present and witnessed the operation, I may mention Charles H. Benni, Prof. Surg. Warsaw Med. College, Russia; Surgeons Wales and Maccoun, U. S. N.; Surg. G. A. Otis, U. S. A., the distinguished editor of the Med. and Surg. History of the War of the Rebellion; Dr. George A. McCoy, Profs. King, Kleinschmidt, and Tabor Johnson; Drs. P. G. Young, Ramsay, Boarman, Eliot, and many others. The patient soon recovered from the influence of the anæsthetic; he was immediately removed to his bed and his right arm wrapped in bats of cotton; beef-tea was given him, of which he partook with avidity; his mind was perfectly clear; there was no cerebral trouble or difficulty whatever. The only inconvenience he expressed after the operation was slight pharyngitis with some impediment in deglutition; these symptoms measurably abated in a few hours; late in the evening an anodyne was administered; he passed a sleepless and uncomfortable night.

Oct. 16. Pulse 110; temp. 99°. Has some slight cough; difficulty in swallowing, accumulation of mucus in pharynx; arm of right side cooler than left; no pulsation in the brachial artery; applied ice to tumour for 15 minutes at a time, then an interval of 15 minutes; pulsation in tumour slightly diminished. ℞. Tinct. digitalis, gtt. 20, to alternate with sol. ferri persulph. gtt. 20, three times a day, and potas. bromid. ʒj to be divided in three doses, to be taken during the day. Anodyne at night if necessary.

17*th*. Pulse 100; temp. 99½°. General condition seems to be better than yesterday. Tumour appears smaller; discontinued cold.

18th. Pulse 100; temp. $100\frac{3}{10}$°. Cough quite troublesome, with quantity of mucus in pharynx; slept poorly last night; force and frequency of pulsation in tumour diminished; tumour points a little. General condition improving. Sat up in bed for short time to-day. ℞. Potass. iodidi, ʒij; aquæ, ℥iss; syr. simpl. ℥ss.—M. S.—Dessertspoonful every 2 hours.

19th. Pulse 100; temp. $100\frac{1}{2}$°. Right hand warmer; cough more troublesome; swallowing and clearing pharynx more difficult. Has slight symptoms of pneumonia.

20th. Pulse 104; temp. $99\frac{4}{5}$°. Tumour hardening and pulsation feebler; pneumonic symptoms have subsided; sat up short time. ℞. Potass. iodid. continued.

21st. Pulse 118; temp. 102°. Tumour has a small white bleb on upper left side; slept tolerably well last night; cough less troublesome; sat up a short time in bed to-day; wounds discharging a small quantity of pus; that over carotid more copious than subsclavian; circulation reappearing in right hand and arm. ℞. Iod. potass. continued.

22d. Pulse 106, and weaker; temp. $100\frac{3}{5}$°. Has pain in right side when coughing; slept well and eats well; bleb has disappeared, leaving a small red base; cough less frequent. ℞. continued.

23d, 10 A. M. Pulse 100, and soft; temp. $99\frac{4}{5}$°. Pain in coughing absent; sleeps badly; does not expectorate as freely as yesterday; three small blebs on red base of first one. 6 P. M. Pulse 118, temp. 102°. Tumour hot; right hand warm; is very restless. ℞. Sol. bromid. potass.

24th. Pulse 116; temp. $103\frac{3}{5}$°. Blebs have a black spot about one-fourth inch square below them; slept very well; has little cough; tumour seems smaller, is hard at bottom, softer at top and is quite warm; wounds still discharging. ℞. Sol. bromid. potass. continued.

25th. Pulse 94; temp. $99\frac{1}{2}$°. Ulceration commences, has a small red spot on right side of it; condition good; not so restless. ℞. continued.

26th. Pulse 90; temp. 98°. Condition still favorable. ℞. continued.

27th, 11 A. M. Pulse 90; temp. 100°. Is quite cheerful and talkative; sits up a good deal; has some cough. 6 P. M. Pulse 92; temp. $100\frac{3}{5}$°. Coughs a great deal and expectorates with difficulty; sleeps better; continues cheerful; ulceration increasing. ℞. Iodid. potass. substituted for the bromid.

28th. Pulse 90; temp. 100°. Condition about same as yesterday. ℞. continued.

29th. Pulse 86, temp. $100\frac{2}{5}$°. Tumour is becoming longer; ulceration has high edges; pulsation in tumour softer. ℞. continued.

30th. Pulse 94; temp. $99\frac{3}{5}$°. Pulsation in tumour very mild; ulceration extending downwards; slept very poorly and is very restless. ℞. continued.

31st, 10.30 A. M. Pulse 92; temp. $100\frac{3}{5}$°. Got up this morning, dressed himself and was shaved, lay down on the lounge; appears very comfortable; pulsation in tumour very feeble; coughs very little; right hand is quite warm. 12.40 P. M. About 12.30 P. M. got up and while the attendants were engaged walked down the hall to the water-closet; while there the sac ruptured and the blood was thrown out in a jet (quantity lost in the neighbourhood of 16 oz.). Prof. J. Ford Thompson, being at the time in the hospital, was summoned. He speedily suppressed the hemorrhage with compresses of lint saturated with Monsel's sol. persulph. of iron. On my arrival at the hospital I found the patient in a

very critical condition; the compresses were yielding to the force of the impulse of the aneurism and I expected an immediate recurrence of the hemorrhage, which would have unquestionably terminated in death. I at once, with the concurrence of Prof. Thompson, determined to inject the sac with the sol. persulph. of iron, Monsel's. The course was hazardous, but it was thought the best under the circumstances. With the assistance of Dr. Ramsay, house surgeon, I injected ʒvj of the sol. of persulph. into the tumour. This injection of the iron had the effect of hardening the periphery of the tumour. Later in the day, finding considerable pulsation in the axes of the aneurism, I procured a larger trocar and injected through the canula ʒiiss more of the liq. persulph. into the sac. ℞. continued.

Nov. 1. Pulse 128; temp. ranging during the day from 99° to 102°. Slept indifferently; is restless; tumour very hard; cough troublesome. 6 P. M. Pulse 118; is calmer; mind feeble.

2*d*, 10.30 A. M. Pulse 120; temp. 98°. Tumour hard; cough troublesome; mind feeble. 7 P. M. Left hospital at 6 P. M. of his own accord on a stretcher well-propped and wrapped in blankets. Was carried to his home. Ligature on subclavian came away to-day. No hemorrhage.

3*d*, 10 A. M. Pulse 90; temp. 100°. Slept well; cough slight; mind tranquil; bore removal well; there is a little oozing of bloody serum from around the point of rupture. 2 P. M. Oozing has stopped Pulse 90; temp. $99\frac{1}{5}$°. 7 P. M. Is sleeping quietly. ℞. continued.

4*th*, 10 A. M. Pulse 90; temp. 100°. Is delirious at times; rested badly; eats very little; does not cough much; right hand is cool. 7 P. M. Pulse 98; temp. $100\frac{4}{5}$°. Has pain in neck; eats very little; cough is very troublesome. ℞. Morph. sulph. gr. j; aquæ, ℥j.—M. S.—Teaspoonful every three hours, and ℞. continued.

5*th*, 10.30 A. M. Pulse 106; temp. 101°. The appearance of the tumour to-day is peculiar, the contents of the sac are protruding; the apex is dry and perfectly solid; around the protruding mass a clearly marked line is formed, not unlike the line of demarcation in gangrene; below the line and protruding mass a space one-third of an inch in width is observed entirely encircling the tumour and discharging bloody serum mixed with puriform matter; sleeps during the day, and at times delirious. ℞. continued.

6*th*, 10.30 A. M. Pulse 110; temp. 102°. Very feeble, restless with occasional naps of sleep, rousing suddenly and wandering in mind. Can push the finger entirely around the protruding mass, the sides of which present a red colour; the discharge from the chasm is sanguineous and puriform; dressing of carbolized oil applied. 7 P. M. Pulse 100; temp. $100\frac{3}{10}$°. Mass coming out slowly, presenting the appearance of a root; black apex and red sides; character of discharge same. 11 P. M. Pulse 114; temp. 101°. Has slight cough, subsultus tendinum; is extremely feeble; mass slowly coming out; can easily pass the finger to the depth of the middle of the first phalanx into the space between the margins of the chasm and the protruding mass; discharge is more purulent; has considerable pain in the neck; sits up on side of bed occasionally; at times delirious; mind easily recalled, and replies to questions rationally; head very hot; perspiration copious. Anticipating hemorrhage during the night; I requested Dr. J. L. Eliot to remain with the patient, with directions, if hemorrhage should occur, to remove the mass and stuff the

apertures with lint saturated with the sol. persulphate of iron. ℞. continued.

7th, 9 A. M. Mass came out while coughing, not a drop of blood was lost; in coming out the mass described a curve from right to left. The tumour had entirely disappeared and in its place a chasm of sufficient capacity to receive at least three fingers. Upon examination I could distinctly see the remainder of the coagulum, rising and falling with the cardiac impulses. Apprehending hemorrhage, I introduced some pieces of lint saturated with solution of persulphate of iron into the cavity. Administered an anodyne. Pulse 120; calm and perfectly rational; expressed hope that he might now recover, since the "swelling" had disappeared; says he is hungry and desired some food, but experienced difficulty in swallowing nourishment when given him.

On leaving the patient, I directed the nurse, his wife, if hemorrhage should take place, to stuff the cavity with lint saturated with sol. persulph. iron. 4 P. M. Hemorrhage took place; a pint of blood lost; faithful to my instruction, the cavity was packed with lint and persulph. which controlled the bleeding. 7 P. M. Pulse 135; growing more feeble. ℞. continued.

8th, 10 A. M. Pulse 128; very slight hemorrhage all night; expressed a desire to eat, but owing to the difficulty in swallowing refuses nourishment; insomnia last night, though an anodyne was administered; deglutition difficult, accumulation of mucus in pharynx so abundant as to cause choking; continually asking for water. 7 P. M. Pulse 130. Does not eat or sleep; delirious at times, but recognizes those about him.

9th. Died this morning at 6 o'clock.

Autopsy made eight hours after death. Carotid ligature lying loose in the wound. The examination of the body revealed the following pathological condition: The floor of the transverse portion of the arch of the aorta was atheromatous; the roof and parietes of the vessel were greatly thinned; the aortic aperture into the arteria innominata was two inches in diameter, and involved the left carotid artery in its expansion. The anterior wall of the arteria innominata was developed into a sacculated aneurism; the vertical diameter of the sac was $5\frac{5}{8}$ inches; the transverse 4 inches; antero-posterior $3\frac{5}{16}$ inches. The roof of the sac had disappeared in consequence of rupture and sloughing; the sac was entirely occluded by concentric laminæ of fibrinous coagulum, the coagulum extending into the subclavian and carotid arteries. The clot which came away a few days before death was of the same character but denser in structure; it measured $4\frac{3}{8}$ inches in length, with a mean diameter of two inches.

There can be no question as to the cause of the poor fellow's death. It will be recollected that he had two hemorrhages from the ruptured sac, the first one on the 16th day after the operation, the second on the 23d day, two days preceding his death, making an interval of seven days between the hemorrhages. From the first hemorrhage he lost about a pint of blood; from this loss he did not appear to suffer severely; he soon recovered his strength and spirits. About the same quantity of blood was lost by the second hemorrhage; this hemorrhage was not sufficient to have caused him to sink as rapidly as he did; it is true there was some oozing of blood from the sac while it was undergoing the ulcerative process, but

that loss of blood would not have reached four ounces, losing in all 36 or 38 ounces in the course of twenty-five days, which was not thought sufficient to have caused his death. Prof. Thomas Antisell, of our city, has made a suggestion which may aid in solving the difficulty; it is this: he is of the opinion that the coagulum formed in the occluded arteria innominata, together with that of the protruded coagulum, the dimensions of both have already been given, would represent a considerable share of the circulatory fluid,[1] the gradual formation of these clots by abstracting blood from the general circulation was one of the principal factors in producing the rapid exhaustion following the second hemorrhage.

His diet from the day of the operation was nutritious but unstimulating.

WASHINGTON CITY, D. C., January 31, 1877.

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[1] The weight of the extruded clot, as examined at the Army Medical Museum, was six ounces avoird.; it was dry from previous maceration in alcohol, and crumbled partially under the finger. In this condition of freedom from water it represents 12 87 per cent. of blood withdrawn from circulation; and is equivalent to a total volume of blood of 46⅔ ounces, or 2 pounds 14⅔ ounces.

Note by Prof. Antisell.—The additional clot remaining in the sac was of almost the same dimensions (slightly more), and would, therefore, have about the same weight—the total blood therefore represented by the whole clot would be equal to 5 pounds 13 ounces, which, with the hemorrhages, about 38 ounces, would represent a total loss of blood to the system of 8 pounds 3 ounces. The weight of the man at the period of operation did not exceed 130 pounds, and the estimated weight of blood in such a frame is $\frac{1}{13}$th or about 10 pounds, out of which on deduction of loss of 8 pounds 3 ounces there would remain in the body only 1 pound 13 ounces at the time of death.